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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,051	01/28/2004	Malte Kumkar	15540-020US1 / 25 216 RK/	9616
26171 7590 05/09/2007 FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER VAN ROY, TOD THOMAS	
			ART UNIT 2828	PAPER NUMBER
			MAIL DATE 05/09/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/765,051

Applicant(s)

KUMKAR ET AL.

Examiner

Tod T. Van Roy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5 and 7-15 is/are rejected.
- 7) ☒ Claim(s) 2-4 and 6 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 03/19/2007 have been fully considered but they are not persuasive.

With respect to claim 1, the Applicant has argued that the combination of Tidwell in view of Ireland is non-obvious.

Applicant's arguments (summarized)

Examiner's response

A. Ireland does not describe or suggest a "diffusive reflective surface".

The Examiner does not agree. The Examiner does agree that the spaced reflector does set up the condition of total internal reflection (TIR) inside of the gain medium, but does not agree that the surface cannot be considered "for diffusing". According to Merriam-Webster's Collegiate Dictionary (10th edition, see 'diffusive' and 'diffuse'), diffusion can mean: "not concentrated or localized", as well as "to cause to spread" and "extend". The Examiner believes that the spaced reflector of Ireland meets these descriptions. First, as seen in fig.14, the reflector causes the input light to be "not concentrated or localized" as the reflector redirects the light back into the gain medium, rather than being "concentrated or localized" to only the input light path. Second, Ireland teaches the path of the input light to "spread" or "extend" via the use of TIR caused by the reflector placement (col.4 lines 47-62, col.7 lines 38-43). Therefore, the spaced reflector acts as a "surface for diffusing light" as limited by claim 1.

B. Ireland does not teach an end pumped laser.

The Examiner agrees that Ireland does not teach an end pumped laser, however, Ireland was not relied upon for the teaching of end pumping, only for the spaced apart reflector modification.

C. Modification of Tidwell's system to include a reflective diffraction grating spaced from the side surface would change the principle of operation of Tidwell, which explains that the reflective coating is diffusive to provide for a greater number of path lengths reflected back and forth in the laser medium.

The Examiner agrees that this is how Tidwell's system operates, and Ireland's spaced apart reflector (col.4 lines 47-62, col.7 lines 38-43) is used for the same path length extension purpose.

D. Ireland teaches away from the use of the spaced apart reflector in an arrangement wherein the pumping light is along the optical path.

The Examiner does not agree that this passage of Ireland teaches away from using the spaced apart reflector while end pumping the gain medium. It is clear that Ireland is presenting an alternate embodiment wherein an optical element is provided between the pump source and the gain medium in order to redirect the pumping light "substantially" along the optical axis. Ireland then states that while using this system, "no special arrangement is needed for reflection after the initial pass". This embodiment appears to describe the use of a specific optical element (examples given: holographic element or prism) being placed in the pumping beam path that reduces the need for a "special arrangement" after the initial pass. As Tidwell does not teach the use of a direction changing optical element used to change the pumping beam path (near to 90

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degrees), the two embodiments are believed to be substantially different, therefore, Ireland is not believed to teach away from the cited Tidwell reference.

The Examiner further suggests that the Applicant includes the pumping only through an end surface limitation into the claim body. At this point, the statement is found in the preamble, which can be considered non-limiting as follows:

A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 5, 7, 11-12 and 13-15 are rejected under 35 U.S.C. 103(a) as being anticipated by Tidwell (WO 93/23899, applicant submitted art) in view of Ireland (US 5048044).

With respect to claims 1, 5 and 11, Tidwell teaches an apparatus for optically pumping a laser-active solid body with pumping light coupled into the solid body through only an end surface of the solid body (fig.1), the apparatus comprising: a laser-active solid body (fig.1 #4) including an end surface through which pumping light is coupled into the solid body (fig.1 #4 left side) and a lateral surface through which pumping light reflects from the solid body (fig.1 #4, top and bottom lateral surfaces to coating); a reflector surrounding the laser-active solid body at a distance from the lateral surface of the solid body for reflecting light that exists the solid body back towards the solid body (pg.5 lines 1-14, coating), and that the surface is diffusive. Tidwell does not teach the reflector to be spaced from the solid body to form an annular gap. Ireland teaches a pumped solid state medium wherein a diffusive reflective surface is spaced from the solid state body (fig.13) forming a gap. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the diffusive reflective surface of Tidwell with the spaced apart diffusive reflective surface of Ireland in order to form a gap to allow for the insertion of a cooling medium (Ireland, col.6 lines 56-60).

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With respect to claim 7, Tidwell and Ireland teach the lateral surface of the solid body has a mirror like smooth surface (when diffusive surface is spaced from the solid body the surface is left smooth, Ireland fig.13).

With respect to claims 12, Tidwell and Ireland teach the apparatus outlined in the rejection to claim 1, including the cooling medium to be water (Ireland, col.6 lines 56-60, index of the medium close to water, col.4 lines 35-37).

With respect to claims 13-15, Tidwell and Ireland teach the apparatus including all of the limitations in claim 1, but do not teach the amount of light which is diffused. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose the amount of diffused light to be 3, 20, or 40 percent as it has been found to be not inventive to discover the optimum, or working, range by routine experimentation (see MPEP 2144.05 II A - In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tidwell in view of Ireland and Honea et al. (US 2002/0118718).

With respect to claim 8, Tidwell and Ireland teach the apparatus as described in the rejection to claim 1, including a medium disposed on the outside of the lateral surface (Tidwell, pg.4 lines 28-30), but do not teach the medium to be of a higher refractive index. Honea teaches a solid state pumping apparatus that uses a medium of high refractive index ([0006]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Tidwell and Ireland with the

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index difference of Honea in order to suppress parasitic oscillations in the active media (Honea, [0006]).

With respect to claim 9, Tidwell, Ireland and Honea teach the apparatus as outlined in the rejection to claim 8, and Tidwell further teaches the medium to be disposed in the form of a layer on the lateral surface (fig.1).

With respect to claim 10, Tidwell, Ireland and Honea teach the apparatus as outlined in the rejection to claim 8, and Ireland further teaches the reflector has a surface that diffusely reflects exiting pumping light (see claim 1).

Allowable Subject Matter

Claims 2-4 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claim 2 is believed to be allowable as an end pumped laser apparatus having a diffusive lateral surface and a spaced apart annular reflector was not found to be taught in the prior art. The combination of Tidwell with Ireland was found to teach separating the diffusive element from the lateral surface and applying it to a spaced reflector. These references were not found to teach or motivate an end pumped laser to have both the lateral surface and the reflector be diffusive; additionally, no references taught the lateral surface to be diffusive and a spaced apart reflector to be present.

Claims 3-4 are allowable as they depend from claim 2.

Claim 6 is allowable based on the fact that an end pumped laser system with a reflector spaced from the active media via an annular gap, having both the lateral surface and the reflective surface being diffusive was not found to be taught in the prior art, or an obvious combination of the prior art. Namely, it was not found to be obvious to prepare not only the reflector or the lateral surface, but instead to coat both surfaces to provide the diffusive light to the active media.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

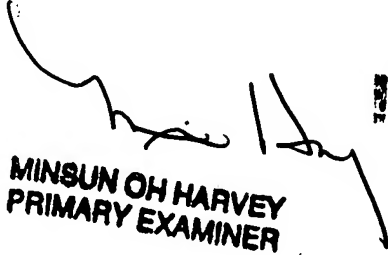
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR


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PRIMARY EXAMINER